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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/024,582

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Dong Ho Kang

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05/20/2004

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EXAMINER

NGO, HUYEN LE

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N

10/024,582

Applicant(s)

KANG ET AL.

Examiner

Julie-Huyen L. Ngo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 1-9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the recitation calling for "a TFT substrate including a plurality of pixels of R, G, and B," recited in line 2 of claim 1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 1-9 are objected to because of the following subject matter:

In line 6 of claim 1, the recitation calling for "the other" is unclear of what Applicant referred to. It appears that it should be __ the other substrate, which the plurality of spacers is not formed. Also, in line 2, the recitation calling for "a TFT substrate including a plurality of pixels of R, G, and B" is objected to because it appears that the plurality of pixels of R, G, and B is included in the color substrate not the TFT substrate.

Claim 2 is objected to because it is unclear whether the space Applicant referring to as "one column spacer is provided for every two pixels" is one of the spacers recited in claim 1 or another spacer.

In line 3 of claim 3, it would be clear to insert ___, *which* ___ after "substrate".

In claim 5, the recitation calling for "each of the plurality of column spacers having a semi-spherically shaped end portion adjacent to the TFT substrate and corresponding to two pixels" is inconsistent with what being disclosed in the specification and drawing (figure 4). It appears that the spacer is formed at every two pixels in the column direction and every three pixels in the row direction.

In line 2 of claim 9, it would be clear to insert ___, *which* ___ after "substrate".

All claims that are depended from the above-mentioned claims and are not specifically discussed above are objected as bearing the defects of the claims from which they depend.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4 and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 4 and 8, the recitation calling for "at least one protrusion extending from each four sides of the square shape" was not described in the specification. Particularly, the recitation "**at least**" calling for more than one protrusion extended from each side of the square shape. However, according to figure 5, there is only ONE protrusion extended from each side of the square shape.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In line 2 of claim 1, "*a TFT substrate including a plurality of pixels of R, G, and B*".

Claims 2-9 are rejected as bearing the defect of claim 1 from which they depend.

Claim 7 is rejected under 35 U.S.C. 112, first paragraph, because the best mode contemplated by the inventor has not been disclosed.

Applicant fails to disclose why is the width of about 279 to 600 μ m for each of the plurality of column spacers to space apart from one another is critical.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 3, 5 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikeda et al (US 6671025 B1).

Claims 1 and 5:

Ikeda et al teach (figure 3) forming a an LCD device comprising:

- a TFT substrate 30 including a plurality of pixels
- a color filter substrate 40 that is spaced apart from the TFT substrate
- a plurality of column spacers 45 selectively formed on one of the TFT substrate and the color filter substrate, the column spacers having a semi-spherically shaped end portion adjacent to the other substrate, which the plurality of column spacers 45 are not formed;
- a liquid crystal layer 49 injected between the TFT substrate and the color filter substrate.

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Claim 3:

- each of the plurality of column spacers has a contact area region contacting the substrate, which the column spacers are formed thereon, the contact region having a square shape.

Claim 9:

- the semi-spherically shaped end portion has a contact area contacting the other substrate, which the column spacers are not formed on, the contact area having a dot shape.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al as applied to claims 1 and 5 above, and further in view of Miyazaki et al (US 5978061) and Yanagawa et al (US 6583846 B1).

Yanagawa et al teach (figure 28A) distributing spacers 10 uniformly over the entire display area, and each of the spacers 10 is allotted to a group comprising the equal number of adjacent pixels. The number of the spacers 10 disposed in the display area is reduced so as to reduce the orientation defects caused by the spacers 10. This prevents occurrence of unintentional contrast produced by light leakage,

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especially in displaying of a black image. However, It is well known in the art for one column spacer be provided for every two pixels as evidenced by Miyazaki et al. (figure 20), and a plurality of spacers are arranged in diamond shapes as evidenced by Yanagawa et al (figure 28A).

Therefore, it would have been obvious for one of ordinary skill in the art to reduce the spacers in Ikeda et al LCD device with one spacer for every two pixels (claim 2) or in diamond shapes (claim 6) for improving the display quality of Ikeda et al. LCD, as taught by Miyazaki et al. and Yanagawa et al.

Allowable Subject Matter

Claims 4 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 4 and 8 would be allowable because there is no prior art of record that teaches a LCD comprise:

A contact a region of each of a plurality of spacers has a square shape with one protrusion extending from each of four sides of the square shape.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kishimoto et al. (US 6396559 B1) disclose a LCD including spacers used in combination with polymer walls.

Nishiguchi et al (US 6226067 B1) discloses a LCD having a plurality of spacers for maintaining a gap between the substrates, and a plurality of resin structural nodules for supporting and adhering said pair of substrates. The resin structural nodules are arranged within a light-modulating region based on a predetermined principle or a predetermined pattern.

Furukawa et al (US 6392736 B1) disclose a method of manufacturing liquid crystal display element includes disposing adhesive on at least one of first and second substrates; disposing spacer particles on at least one substrate with an area ratio of 0.003 or more to unit area of the substrate.

Contact Information

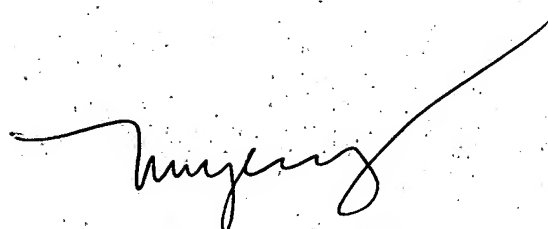
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (571) 272-2295. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (571) 272-2293.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.

May 14, 2004

A handwritten signature in black ink, appearing to read "Julie-Huyen L. Ngo". The signature is fluid and cursive, with a long, sweeping horizontal line extending to the right.

Julie-Huyen L. Ngo

Patent Examiner

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